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Patent
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IN THE CLAIMS:

1. (Currently Amended) An apparatus for analyzing brain functions, comprising:
biosignal detection means for detecting a biosignal that is capable of identifying a
waking level of an examinee in parallel with examination of the brain of the examinee conducted
5 by an MRI System; [[and]]
a functioning part location calculating means for ~~finding out a part of the brain~~
~~functioning in a state where a predetermined event is occurring in the biosignal by calculation~~
~~based on a correlation between time series data of the biosignal and a change in a strength of a~~
~~MRI signal outputted from the MRI system~~ obtaining information on an MRI signal strength at
10 each state where the examinee is in a predetermined sleeping stage and where the examinee is in
a predetermined waking stage;
taking a differential of a change in the MRI signal strength considered significant
in view of the correlativity with the change in state; and
identifying a portion of the brain functioning in the sleeping state from the change
15 in the MRI signal strength.
2. (Original) The apparatus in accordance with claim 1, wherein the predetermined
event is an event based on which a waking level of the examinee is identified.
3. (Original) The apparatus in accordance with claim 1, wherein the biosignal
detection means is configured to detect an electroencephalogram of the examinee as the
20 biosignal.

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4. (Previously Presented) The apparatus in accordance with claim 1, wherein the detection of the biosignal of the examinee by the biosignal detection means and the examination of the brain of the examinee by the MRI system are performed alternately.

5. (Currently Amended) A method of analyzing brain functions, comprising the
5 steps of:

detecting a biosignal of an examinee in parallel with examination of the brain of the examinee conducted by an MRI system; and ~~finding out a part of the brain functioning in a state where a predetermined event is occurring in the biosignal by calculation based on a correlation between time series data of the biosignal and a change in a strength of a MRI signal~~
10 ~~outputted from the MRI system~~

obtaining information on an MRI signal strength outputted from the MRI system at each state where the examinee is in a predetermined sleeping stage and where the examinee is in a predetermined waking stage.

taking a differential of a change in the MRI signal strength considered significant
15 in view of the correlativity with the change in state; and

finding out a part of the brain functioning in the sleeping stage.

6. (Currently Amended) A system for analyzing brain functions, comprising:
a detection unit for detecting a biological function for identifying a waking level of a patient and outputting a biosignal of [[a]] the patient;
20 a brain examination unit for detecting a function of a brain of the patent and outputting a brain function signal; and

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a location calculating unit for ~~calculating a correlation between the biosignal and~~
~~the brain function signal to determine a specific portion of the brain that is active~~ obtaining the
brain function signal from the brain examination unit at each state where the patient is in a
predetermined sleeping stage and where the patient is in a predetermined waking stage by taking
5 a differential of a change in strength in the brain function signal considered significant in view of
the correlativity with the change in state, and determining which portion of the brain is
functioning in the sleeping stage from the differential of the brain function signal.

7. (Previously Presented) The system of claim 6 wherein the location calculating
unit calculates a location based on a correlation between time-series data of the biosignal and a
10 change in value of the brain function signal.

8. (Previously Presented) The system of claim 6 further including an event
identification support unit for identifying an event corresponding with the biosignal.

9. (Previously Presented) The system of claim 8 further including a heart monitor
unit to detect heartbeat noise wherein the event identification support unit can eliminate
15 heartbeat noise.

10. (Previously Presented) The system of claim 9 wherein the brain examination unit
provides an MRI signal and the event identification support unit receives an
electroencephalograph signal and the event identification support unit includes a noise
elimination section and a frequency analyzing section for outputting a display of data on the
20 frequency of occurrences of an event.

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11. (New) An apparatus for analyzing brain functions comprising:

a biosignal detection unit for monitoring an examinee and providing a plurality of biosignals representative of both a predetermined waking stage and a predetermined sleeping stage of the examinee;

5 an MRI unit for taking a plurality of MRI image signals of a brain of the examinee in correlation with the provision of the biosignals from the biosignal detection unit;

means for identifying a specific MRI image signal of the examinee's brain in both the predetermined waking stage and the predetermined sleeping stage based on correlated biosignals; and

10 a functioning brain part location unit for comparing the MRI image signals to identify the location of a functioning part of the brain in the sleeping stage.

12. (New) The apparatus for analyzing brain functions of Claim 11, wherein the functional brain part location unit compares corresponding voxels of the MRI image signals and a differential of the comparison is provided as an image of brain part functioning.

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